

The Hamplatter

A Newsletter for the Fort Wayne Radio Club Members

Vol XX Issue 3

March 1994

From the Prez

What did I just see fly by? Was it February? I guess it was. Where did it go? Who knows? Who cares? Here's a few notable events worth remembering from February:

- 1) K9OMA Jim Pliett gives a program on how a poor married ham can get into ATV. Good job, Jim!
- 2) The FCC says it will start selling "Vanity Calls" for \$60.00 sometime in '94'. Your choice out of 10 choices. What a bargain!
- 3) The Kerrigan/Harding thing is finally over. The same day Lorainea Bobbit is released from a mental institution, she was quickly hired by Harding to sharpen skates.
- 4) The "Mother of all Foxhunts" is history. Orchestrated by K9OMA and KF9DE. N9IWW riding with a ham from the buckeye took first place, with Jim KB9DOT and his gang right on their heels in second place.
- 5) The front cover of QST magazine reads "Cellular Radio Technology, powerful, portable, and a potential new direction for Amateur Radio".....That was February. There couldn't be a better way to start off March than having a program on Cellular Communications. Mark Krumton GTE Cellular Communications General Mgr will talk about the Indiana Cellular Network. Mark will bring a tech with him to answer the tough questions. Should be an interesting meeting (Do I hear a motion for a cellular tower? Hi). Well gang, that's about it. Hope to see you at the meeting. Bring a friend along, and always plenty of hot coffee and donuts available (get there early if you want the ones with the goop - they go first).

Saloon for now.....

Cliff N9MKB

This month's meeting will take place on Friday, March 18, 1994, 7:30 pm at the Salem Church of Christ on Lake Avenue, Ft Wayne.

Code and Theory Classes

The spring semester of morse code and Novice/ Technician theory classes will begin on March 14 and will meet every monday and thursday night, 7-9pm, at the ITT Tech classrooms on Coldwater Rd, next to Red Lobster. Classes will run for six weeks.

The next VE testing will take place on May 7, 1994, 9:30 am, at the Georgetown Branch of the Allen County Fort Wayne Public Library, 6600 E. State Blvd.

Spring Banquet

Mark your calendars for Friday, May 20, 1994. This will be our regular meeting and Spring Banquet. We will have a "carry in" this year. The Club will provide the meat and drinks - and members are requested to bring a dish along (preferably with food in it). All members and their families are welcome (kids too). RSVP to Jean, 637-6426 or Cliff 483-2526.

Fox Hunt Round-Up

February results 1st -¢ Ryan, KA8WEO from Van Wert, OH. The March fox hunt has been scheduled for Sunday the 27th. Meet at the Allen County 4-H Fairgrounds on Carroll Road between 1:30 & 1:45 PM. The hunt will begin at 2:00 PM. For more info, contact Dave, KF9DE either on the I.M.O. Net or on 146.76. The fox will be on 146.43 MHz. Home stations are welcome too.

Van Wert, Ohio Fox hunts are on the first Sunday following the first Saturday of the month at 1:30 pm. Meet at the W8FY clubhouse which is located on the same property as the Ohio State Highway Patrol Post on the east side of the city limits.

February FWRC Minutes

- Carole, WB9RUS

The February meeting of the Fort Wayne Radio Club was called to order by President, Cliff Shreve, N9MKB on Friday, February 18, 1994 at 7:40 P.M. Introductions followed. * The January minutes were read and approved after one correction. The treasurer's report was read. The profit from the auction was \$218.00. * In old business, money has been approved to purchase a controller and a voice recorder for the 76 machine. We will give Bob AB9U the go-ahead to purchase and install it. * The special event station being investigated by Bill Hall, Cliff Shreve, and Dorm Walker is going to be abandoned. HAMS, INC. will have a special event station for the bi-centennial. * Jean Anderson has W9TE QSL cards for anyone who uses the club call. She also has club certificates. * Jean reported on the bulk mail seminar that she and Cliff attended.

Club rosters will be made available, but not until April. * In new business, we need volunteers for Field Day. Jim Wolf wants a break from chairing it after these many years, but he is still willing to help. * The spring banquet will be in May. There were suggestions to have it at restaurant, or catered at the church. Jean moved to decide on the spring banquet at the church basement on the regular meeting night. The motion passed. Jim, K9OMA moved to let the ladies decide the best method to get food for the banquet, and to honor the Old Timers. Ken, K9IJY seconded, motion passed. * John Goller and Lynn Hyndman are going to do an inventory of the club equipment. * At the board meeting the Ladies Auxiliary was brought up. It was suggested it be called something other than "auxiliary". A name will be decided on. * The 91 autopatch seems not to be responsive to tones. The technical committee should check into it. Jim, K9OMA would like an understudy for the repeaters. * March 10, at 7:00 the Whitley County Amateur Radio Club will have it's annual auction. Bring equipment or just attend. * The meeting adjourned at 8:25 and Jim Pliett, K9OMA gave a presentation on ATV.

Respectfully submitted, Carole Burke, WB9RUS

Lightning Protection for Ham Radio Stations

Jim Wolf, KR9U

Proper lightning protection for ham radio stations can involve more variables than any other type of radio site. The following grid shows the combinations available. The antenna location will impact the grounding, while the station location will affect the protection requirements.

The main rule for surviving a lightning strike is still the same, no matter which variation you have: All the I/O's must be protected and be commonly grounded, in a low inductance fashion, to a single point ground system.

The type and location of the antenna will dictate the location and size of your ground system. When the antenna is struck, the ground system must be able to disperse as much of the energy as soon as possible to prevent its travel towards the equipment. This antenna ground system must be interconnected in the ground with a low inductance path to the equipment's ground. The coax shield must not be the only interconnection between the two.

Every conductor has inductance. Ground wires going to ground have calculable inductance before they go below grade. Once in the ground, the inductance does not go away. It is, however, shunted by the earth's conductivity. If the ground is not very conductive, three things can be done to help the situation. First, increasing the surface area of the conductors, will decrease the inductance. Second, doping the soil, will increase the conductivity and thus shunt the inductance of the in-ground conductors. Lastly, installing more radial lines with ground rods, will effectively parallel the inductances and reduce the overall system inductance. A combination of all three will be the best.

The most effective use of materials for grounding is copper strap. Copper is only attacked by acids and even if etched, the time to eat it away is many years. Since lightning has a large spectrum into the VHF range, skin effect is present. Conducted surge current will ride only on the outermost surface of the conductor. Such current flowing on a round member conductor will not make extensive use of the large cross sectional area. With 1 1/2" or larger flat strap of at least 26 gauge, both surfaces will conduct the surge.

Soil doping can be done by adding water or adding saline solution. Earth is a conductor because of the number of ions present. Ionic salts mixed with water make ions. Water alone in its purest form is an insulator. If the soil already has salts present, adding water will help free the ions. The more ions (salts) available, the less the amount of water necessary to reach a given conductivity. If no ions are available, salts, such as Epsom salts, can be added to the soil to increase the conductivity. Depending on rainfall, doping radials at 4lbs per linear foot and 20lbs per rod may last one to two years.

Radials are the most efficient grounding technique as far as use of grounding materials and labor. If one radial gives "X" resistance, two radials will deliver "parallel rule" plus 10%.

Lightning Protection

(continued from page 2)

This rule holds true if the soil has the same conductivity over the entire area. After the first two radials, one needs to double the number of radials each time to use this rule. Radials do have a limit of effective length. If the surge energy has not been launched in 75 feet, the inductance will prevent any further propagation. Therefore, all radials should be at least 50 feet and no longer than 75 feet.

Ground rods should be placed along the length of each radial. The most effective spacing between rods for normal (grass) soil is equal to the sum of the distances in the ground. If two 8 foot rods are to be installed, the sum in the ground would be (8 plus 8) 16 feet total. Therefore, their separation should be 16 feet apart. If the soil is not normal (very dry or sandy for example), the separation may be reduced in order to minimize the interconnect inductance. It doesn't hurt to have them too close, it only costs more in materials and labor.

Since most soils are stratified, the best way to determine the effectiveness of a ground system is to measure it. Most earth resistance meters do not provide inductance values. The best way to determine the sub-layer conductivity is to measure the first ground rod, one foot at a time, as it is being hammered in place. This can provide a profile of the lower layers relative to the first foot. (See our book: "The "Grounds" for Lightning and EMP" or the November 1992 Issue of "Striking News" for more information).

No one should even think about using a non-conductive structure for an antenna support. The lightning problems will be costly to fix. Nothing short of copper plating the pole should be considered a real fix. Only conductive towers or metal poles should be used for mounting antennas high in the air. If either have sliding contacts (crank up towers and push up poles), the joints should be jumpered using short sections of galvanized strap and all stainless steel clamps. Normal (self support and guyed) towers will not need such jumpers. Guyed towers are the best for lightning if the guy anchors are grounded properly. Because the anchors are located away from the tower base, some of the strike energy will traverse the guy to ground, even though the guy wire(s) are very inductive. The more the strike energy is divided, the less there is to go to the equipment.

Copper should never touch galvanized material directly without proper joint protection. Water shedding from copper contains ions which will wash away the galvanized cover of a tower.

Stainless can be used as a buffer material. Beware, stainless is not a very good conductor. If used to buffer copper to galvanized, the surface area of the contact should be large and the stainless thin. Joint compound should also be used to cover the connection so water can not bridge across the dissimilar metals.

Ground mounted vertical antennas are just like a ground mounted tower. If the antenna or tower is mounted on a roof, the inductance to ground will be very significant. Voltages in the order of several hundreds of thousands of volts will be present. To get the inductance down, increase the surface area and number of down conductors.

Lightning has a large magnetic field associated with its typical 18,000 ampere pulse(s). This can and will couple to all conductive materials. To prevent this coupling galvanized sheet steel may be used. This will attenuate the mag field pulse by about 10dB. Distance is the other means to limit coupling. The mag fields drop at one over the distance squared. For roof mounted antennas and towers, the multiple down conductors can be spread over the roof and brought down to ground at multiple locations. This will mean that the ground system will have to be completely around the building (perimeter ground). This will reduce mutual coupling between down conductors and provide a low, unsaturated section of the perimeter to absorb the conducted surge. The mag fields will also be divided and will in theory cancel in the middle of the building. This will minimize coupling to wires inside the building.

Since the tower is a conductor and is grounded, coax lines should be grounded to the tower. Tower and the coax line(s) will share as much strike energy as possible. If coax grounding kits are not installed, more energy could traverse the coax than the tower or because of the inductance (smaller surface) the large inductive voltage drop may cause arcing between the coax line(s) and the tower. This can cause pin holes in the coax for water to enter. This can also happen if the coax line(s) are isolated from the tower. Strike voltages are present on a tower that can jump as much as two feet! The rule is to at least ground the coax lines at the top and at the bottom for towers smaller than 150 feet tall. Notice the word "bottom". Since the tower has some inductance, leaving the tower at a point above ground will allow some of the strike current to continue on the coax line (both center and shield) to the equipment. Once at the equipment, the current will follow the chassis to the safety ground. This will elevate the equipment cabinet to deadly voltages. Deadly for both people and the equipment.

Lightning Protection

(continued from page 3)

In order to protect the equipment, always ground the coax line(s) at the very base of the tower. Rotor control lines should be protected with the protector grounded to the tower or to a designated single point ground plate. The lines, coax and control, should be placed in EMT (metal) conduit which is grounded only at the tower base end. This will act as a faraday shield for the mag fields. The next step is to provide a single point ground plate where all the I/O protectors for the equipment will be placed. This is best located near ground to keep the inductance low. However, if this requires the plate to be too far from the equipment (more than 10 feet or so) and if the mag fields of the strike can couple easily to the interconnecting wires and cables, then it should be located close to but not on any one piece of equipment. (If a rack of equipment is used, the plate can be a rack panel provided all I/O protectors are present and the only ground connection is to the panel and not to any other piece of equipment.)

The grounding of this plate or panel is very important. A low inductance path to ground is a necessity. Only copper strap should be considered. Since strap is flat, the susceptibility to mag fields is only towards its edges. To prevent coupling, the strap should be oriented with the flat side towards the tower. The plate should also be oriented with the flat side to the tower. Coax lines should not have extra turns in them. Even though this may seem like a good idea because lightning does not like to go around corners, the added inductance can also act as a transformer coupling more energy onto the line. Route all ground straps and grounding conductors so that they have a gentle bending radius. Sharper than 8" radius will add unwanted inductance to the desired ground path. Even for conductors buried in the ground, try to prevent any additional sharp bends.

In the equipment room, all pieces of equipment must be bonded together with low inductance strap. This must be bonded to the single point plate. The plate is then grounded to the earth ground system. Power, telephone and coax line protectors must be present (if used) on the plate. Additional protectors may be used to protect the entrance locations for the power and telephone lines. This will provide added protection for other jointly used equipment (answering machines, appliances etc.)

Remember that equipment damage can happen in either of two ways: From a strike down the road incoming on the power/telephone lines or from a strike to the tower where the ground system is not adequate and the entire ground system rises.

In this latter scenario, protectors fire and dump strike energy onto power and phone lines (any line leaving the area of elevation). If the protectors are spread out from each other, they cannot work in unison to keep voltage levels within a tolerable range for equipment survival.

Extra separation between the struck tower and the equipment also gives additional time for the ground system to disperse the strike charge into the ground. This together with the added inductance of the coax lines helps buffer the energy from entering the equipment area.

Coax protectors should be units that have dc blocking. This provides a high pass filtering which prevents the low frequency energy of lightning from continuing to the equipment. It is picked off and diverted to the ground system in a controlled, preconceived fashion. This dc blocking ensures the operation of the protector regardless of the input circuitry of the equipment.

Did you know that dc continuity units will not work on receivers and shunt fed duplexers! This is not a well known fact. The shunt to ground inside a receiver (coil to ground for static draining) prevents the low frequency lightning energy from being conducted by the protector. The coil shunts the energy to ground alright but it is at the wrong place. It is not at the low inductance path to ground, it is inside the radio. If the coil can't handle this energy (half the coax surge energy is on the center pin and half on the shield), it will open up and now the current through the coil translates to a large open voltage source, capable of arcing just about anywhere it pleases. The absolute best protector not only dc blocks the center pin energy but also the shield. This type protector prevents the shield energy from continuing to the equipment chassis. There is a limit to the protector's withstand voltage and if proper single point grounding is exercised, the voltage will not exceed this 10kV level.

Lightning protection can be summed up simply: You have control of the lightning strike energy and not Mother Nature. Once control is lost, all can be lost.

The Northeastern Indiana Severe Weather Spotting Program

Joel - KB9RH

One of the public service activities of radio amateurs in northeastern Indiana is the severe weather spotting program - also known as Skywarn. Storm spotters are volunteers that have been trained to report certain conditions that are generally associated with severe thunderstorms. Reports from spotters in the field are used to supplement radar observations.

Weather Spotting

(continued from page 4)

The storm spotter training session for Amateurs in Allen County is scheduled for Tuesday March 15th (see the meeting notice elsewhere in this newsletter for time and place). Any licensed Amateur who is interested in becoming involved is welcome to attend.

Russ Marshall - Official-in-Charge of the local National Weather Service office - says this years training session will have something for everyone: a "back to the basics" approach for new spotters, and some advanced material - including an advanced spotter training guide - for veteran spotters. *

The severe weather season in our area generally begins in March and runs through August. Statistically, for the 30-year period 1959-1988 Indiana ranked sixth in the nation in the number of tornadoes and first in tornado deaths per square mile. This is why our reports are so important.

I. An Overview of the Storm Spotter Program

When a Severe Thunderstorm Watch or a Tornado Watch has been issued by the National Severe Storms Forecast Center in Kansas City, local weather officials assess the current storm situation; if conditions are indeed favorable for severe weather, trained net control operators are sent to the Weather Service office at Fort Wayne International Airport. Their job is to receive incoming reports from spotters, and to relay severe weather warnings, statements, or any other information to spotters monitoring the frequency.

Whenever the station at the Weather Service is operational, the letters "WX" are sent in CW just before the squelch tail drops on the 146.88 repeater. However, if storms are not affecting northeastern Indiana or northwest Ohio, the Weather Service may place spotters on "standby". This means that we may possibly be activated at a later hour. *

The 146.88 repeater also functions as the primary net frequency for all 16 counties under the responsibility of the Fort Wayne office. Stations from outside Allen County use the primary net to relay reports from their own area nets.

II. Repeater Use During Severe Weather Activation

During periods of severe weather the 146.88 repeater may be placed in any one of three conditions that partially or totally restrict routine use of the system. This is done to keep the frequency open so that any urgent weather information can be passed. The type of restriction depends on the weather situation at any given time. The three conditions are:

Watch Condition - A Watch condition means that a severe weather watch has been issued by the National Severe Storms Forecast Center. Routine use of the repeater is permitted; however, stations using the repeater are asked to keep transmissions short and to leave long breaks between transmissions.

Warning Condition - a Warning Condition means that the National Weather Service has issued a severe thunderstorm or a tornado warning for Allen County. Routine use of the repeater stops and all calls must go through the net control station.

Emergency Condition - an Emergency Condition means an emergency or very high priority situation exists (for example, a funnel cloud is being tracked visually). No transmissions are permitted unless directly related to the situation.

III. What to Report and Calling in Your Report

Here is a listing of the weather conditions the National Weather Service would like to have reported. Please note the words in parenthesis; these are important items to be noted and/or included in your report:

1. Showers or thunderstorms in which the entire storm is rotating. (Rotation)
2. Tornadoes, Funnel Clouds, or Wall Clouds. (Rotation)
3. Hail 1/2 inch in diameter (dime size) or larger. (Size)
4. Thunderstorm winds 45 miles per hour or greater. (Velocity)
5. Heavy Rain with visibility 1/8 mile or less. (Visibility)
6. Rainfall amounts greater than 2 inches in 2 hours. (Amount/Time Period)
7. Damage (such as large limbs, structural damage, etc.).
8. Urban Flooding (such as cars stalled, streets/underpasses closed, etc.).

Please do not report any other weather conditions unless requested to do so by the net control station. The only exception is when the net control asks for reports from a specific area. When calling in your report, please give the following information to the net control station:

1. Your call sign
2. What you have observed (and be specific!)
3. Your location

Then remain on frequency for a few minutes. The radar operator may ask the Net Control to get additional information from you. If you believe you have a reportable weather condition but are not sure, report it anyway! Simply report what you have seen, say you are not sure, and indicate why you are not sure (you may have reduced visibility because of heavy rain, you may be too far away to be sure, etc.).

Weather Spotting

(continued from page 5)

There may be other spotters in the area that can clarify your report, and your report can also be checked out on radar. There are times when severe weather occurs even though there is no official weather watch in effect and the Amateur station at the Weather Service has not been activated. If you have something to report in this situation, give your call sign and indicate you have a severe weather report. Any station with access to a telephone can call in your report, plus a number of stations have access to an unlisted hot line number for this purpose.

A complete discussion of all situations and procedures is of course not possible here. If you have any questions feel free to talk to any of the following: Hap W9PRO, Rick KV4GC, Howard N9ADS, Jim N9ERM, Larry KB9OS, or myself.
from Joel KB9RH

DX News

OPDX/BARF-80

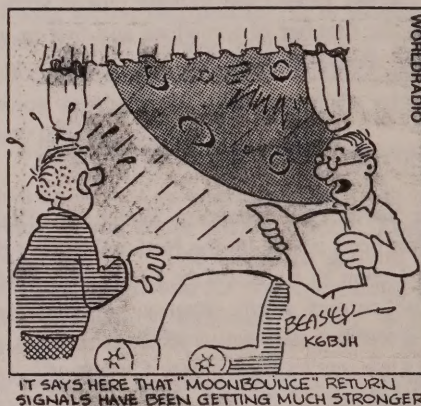
BV9P, PRATAS ISLAND. The targeted date is March 16 for 10-days. There are 14 operators scheduled to go.

PACIFIC DXPEDITION (KC6/KH2/V63). JR6IQI and JK6UER are spending their honeymoon at various places in the Pacific, and will operate all bands both CW and SSB. Their itinerary is as follows: Belau - March 13-16 as KC6KT and KC6UA; Micronesia (V63) - March 16-18, call unknown; Guam (KH2) - March 18-20, KH2/JK6UER.

(Yeah, right! How much air time did YOU folks operate during your honeymoon? - Kris, KF9AW)

TM50DAY CANCELED. The special event station in Normandy, France to commemorate the 50th anniversary of D-DAY as been canceled. The two Dutch groups who have been planning the operation for more than a year were to be active from June 6-9, 1995. The group was issued the special call sign in July 1993. But since then the French license authorities have withdrawn the call sign stating they made a mistake by giving the group a two digit prefix. Meanwhile, there is word that the French operators might be organizing a special event station.

If you want to listen to a nationally broadcast radio show on ham radio, listen to WPDJ AM (1300 on your dial) at 6:00 PM Sunday evenings. The show is called "Ham Radio & More" and is hosted by Len Winkler, KB7LPW.



Do you have an interesting article, news item, or cartoon which you can contribute to the Hamsplatter? Do you have some spare equipment collecting dust that you want to sell? If so, please contact me, Kris, KF9AW. My day phone is 487-3286, evenings 486-7324. Packet messages can be directed to me on 144.91, cluster KR9U or K1FJ-2, or on 144.97, W9INX.

The Hamsplatter

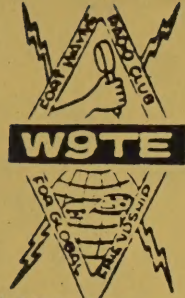
Is published monthly by the Fort Wayne Radio Club,

PO Box 15127, Ft. Wayne, IN 46885

PRESIDENT: CLIFFORD SHREVE, N9MKB
VICE PRESIDENT: JIM PUETT, K9OMA
SECRETARY: CAROLE BURKE, WB9RUS

TREASURER: THERESA DEVENTER, N9UKM
COMMUNICATIONS: JEAN ANDERSON N9PXF
EDITOR: KRISTOPHER STALLER, KF9AW

Repeaters: 146.16/.76 449.875/444.875 (Voice) 146.31/.91 (Autopatch)
439.25/910.25 (Video) 144.34 (Aux sound input to video)



W9TE FORT WAYNE RADIO CLUB, INC.
P. O. Box 15127 Fort Wayne, IN 46885
146.76/16 146.91/31 444.875/449.875
ATV REPEATER: 910.25 Video Out
439.25 Video In & 144.34 Audio In



1994 MEMBERSHIP DATA:

NAME _____ CALL _____ CLASS: N T G A E

MAIL ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

HOME TELEPHONE # (____) _____ WORK TELEPHONE # (____) _____

SHALL WE LIST YOUR ADDR/PHONE# IN MEMBER ROSTER? Y N ARRL MEMBER: Y N

FORT WAYNE RADIO CLUB MEMBERSHIP HANDBOOK

Provided at no cost to club members, this handbook provides a full set of information about present and past club activities, events, and functions. The handbook is available in a clear cover binder, and is upgradeable by easy insertion of new pages into the three-hole binder.

FORT WAYNE RADIO CLUB 70th ANNIVERSARY LAPEL PIN

This fine jewelry piece is in celebration of the 70th anniversary of the FWRC and its predecessors. The pin features a full color version of the club logo.

MEMBERSHIP TERM: (JAN-DEC) (JULY-DEC, July 1-Dec 31 ONLY)

FAMILY MEMBERSHIP: _____ \$21.00/yr \$10.50/yr immediate family(list all calls)

REGULAR MEMBERSHIP: _____ \$15.00/yr \$7.50/yr licensed member

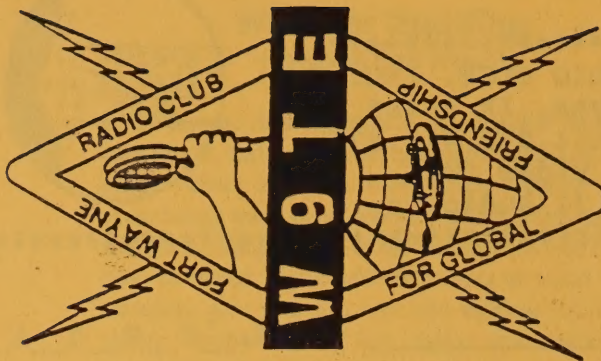
STUDENT MEMBERSHIP: _____ \$ 6.00/yr \$3.00/yr full time student

ASSOCIATE MEMBER: _____ \$15.00/yr \$7.50/yr unlicensed member

YOUR CHECK NUMBER # _____ PLEASE PAY BY CHECK, ITS EASIER FOR BOTH OF US!

PLEASE RENEW YOUR ARRL MEMBERSHIP THROUGH THE FORT WAYNE RADIO CLUB, INC.

ITS EASY! SEND YOUR ARRL RENEWAL FORM AND A CHECK (payable to FWRC) TO THE CLUB.



March 1994

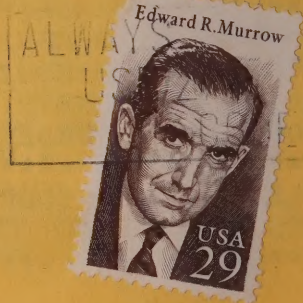
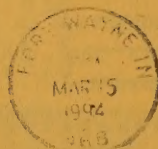
H A M S P L A T T E R



FORT WAYNE
RADIO CLUB

FORT WAYNE, IN

FROM: THE FORT WAYNE RADIO CLUB
P.O. BOX 15127
FORT WAYNE, IND 46885



TO: Jim + Anne Platt
16702 Wappes Road
Churubusco, Ind.
46723